

3

Fig. 1 is a schematic diagram of a prior art device. The device includes a substrate 100, a first layer 104, a second layer 106, a third layer 108, and a fourth layer 110. The first layer 104 is disposed on the substrate 100, and the second layer 106 is disposed on the first layer 104. The third layer 108 is disposed on the second layer 106, and the fourth layer 110 is disposed on the third layer 108. The first layer 104 has a thickness 'd', and the second layer 106 has a thickness 'h'. The third layer 108 has a thickness 'r', and the fourth layer 110 has a thickness 't'. The first layer 104 is made of a material having a refractive index 'n1', the second layer 106 is made of a material having a refractive index 'n2', the third layer 108 is made of a material having a refractive index 'n3', and the fourth layer 110 is made of a material having a refractive index 'n4'. The device is used for optical applications.

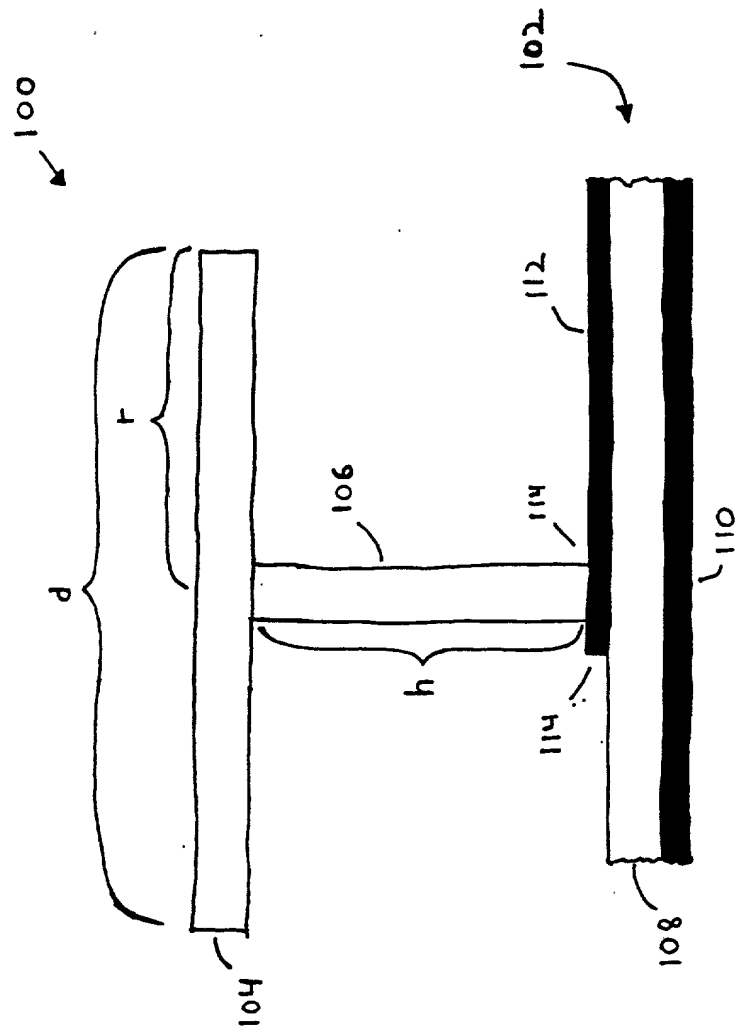
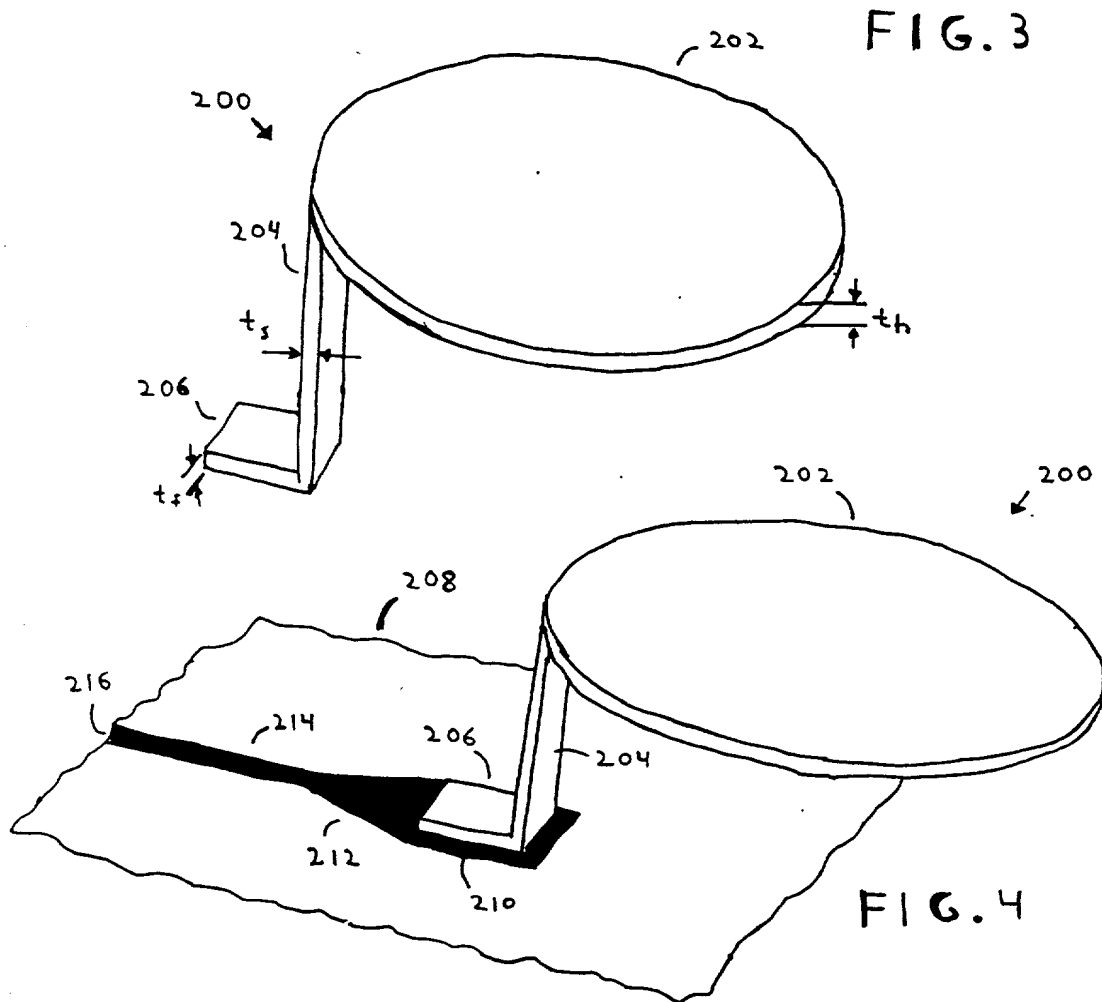
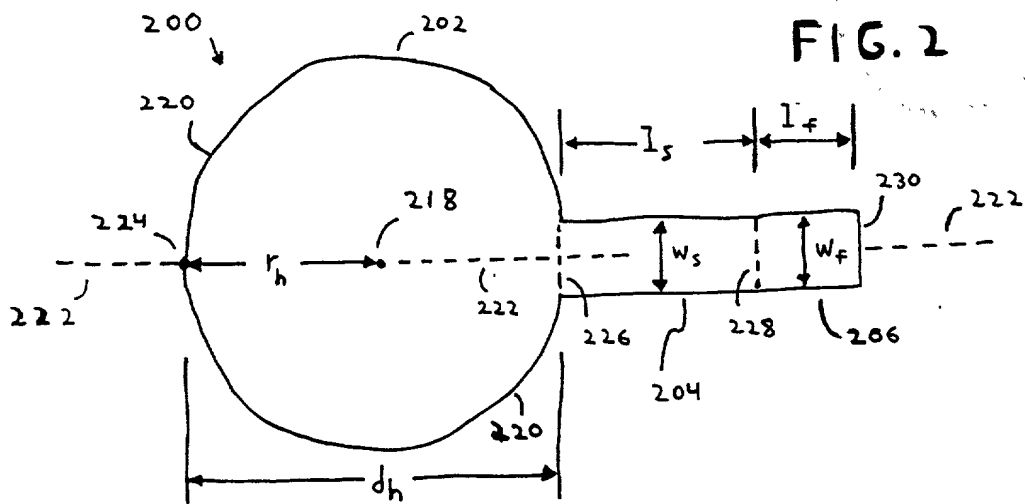


FIG. 1 PRIOR ART



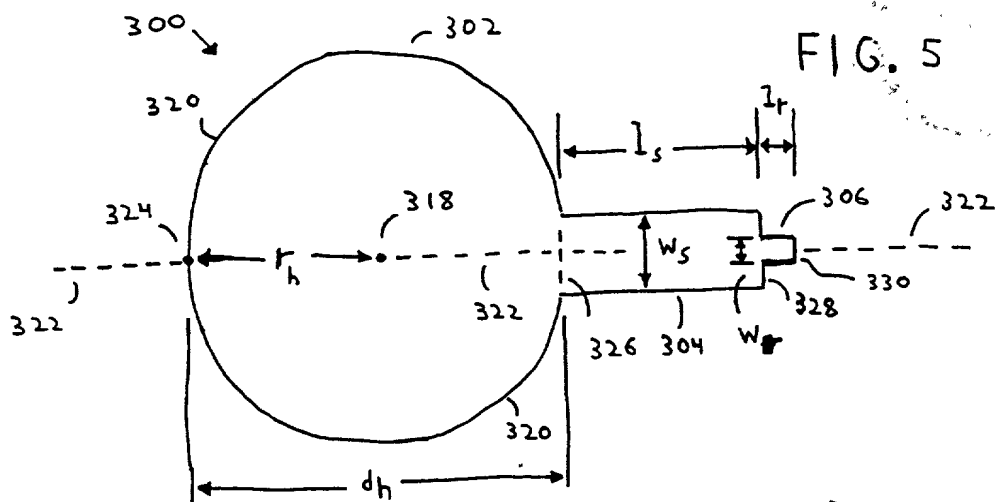
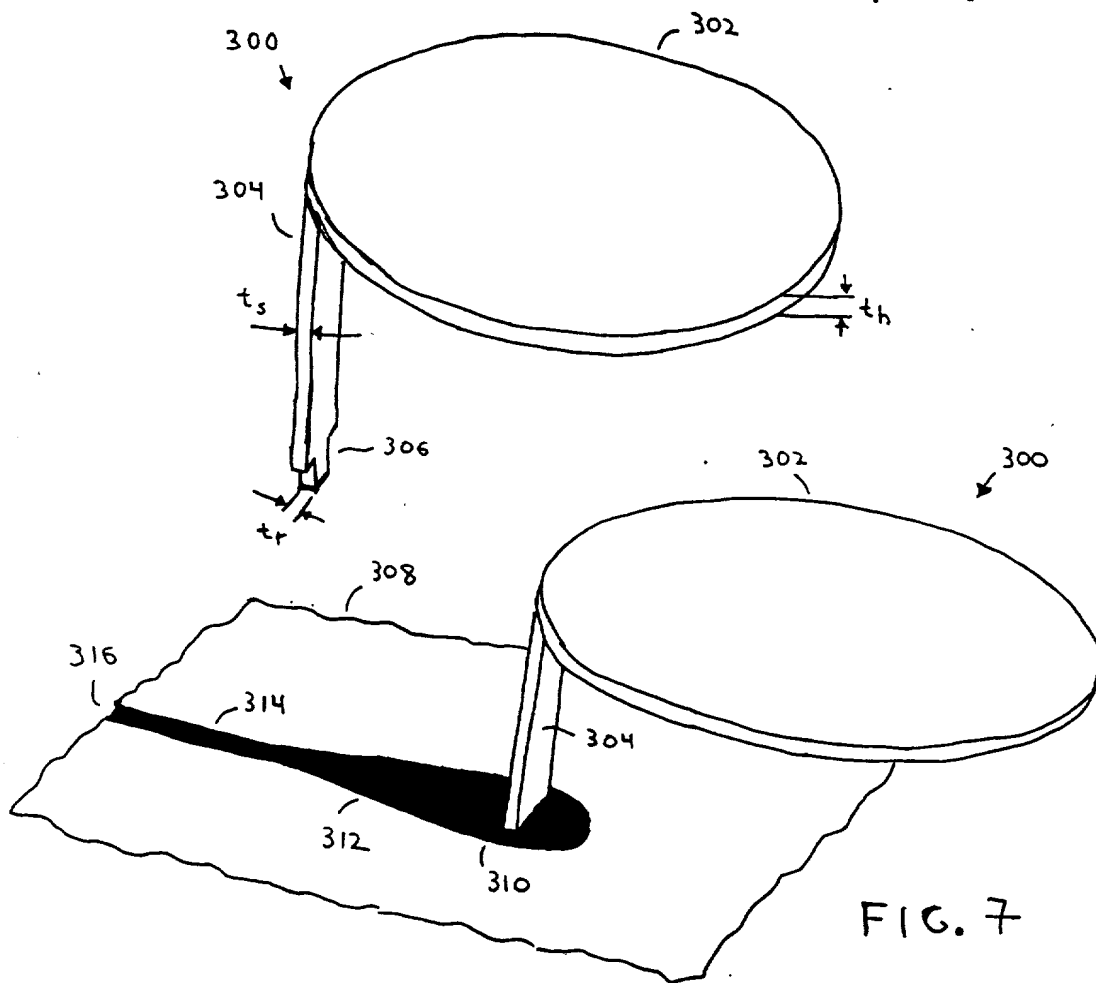
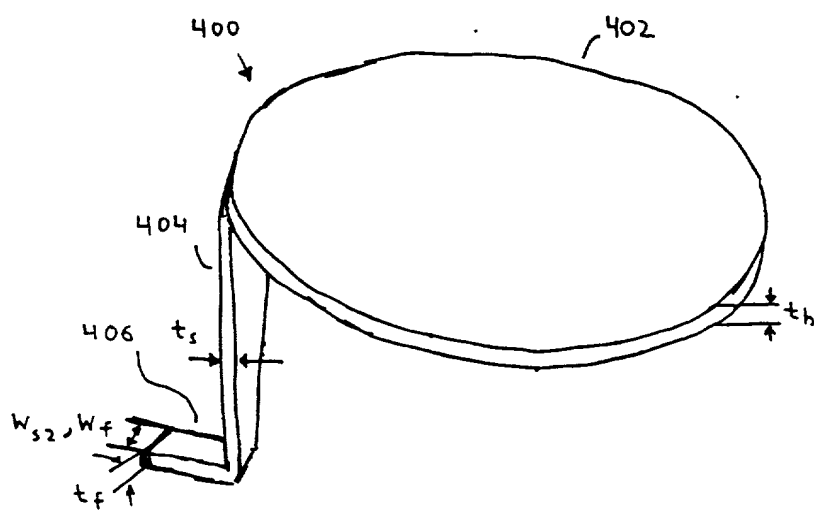
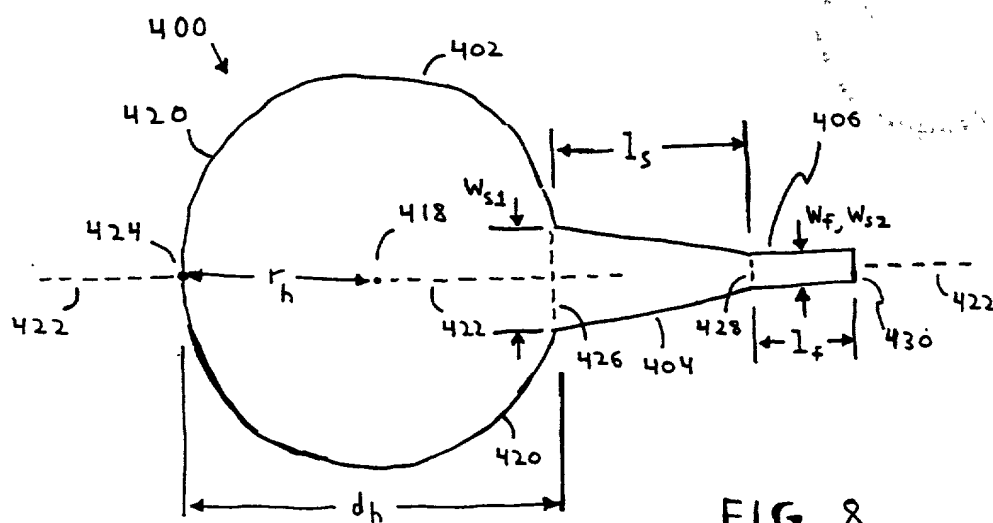


FIG. 6





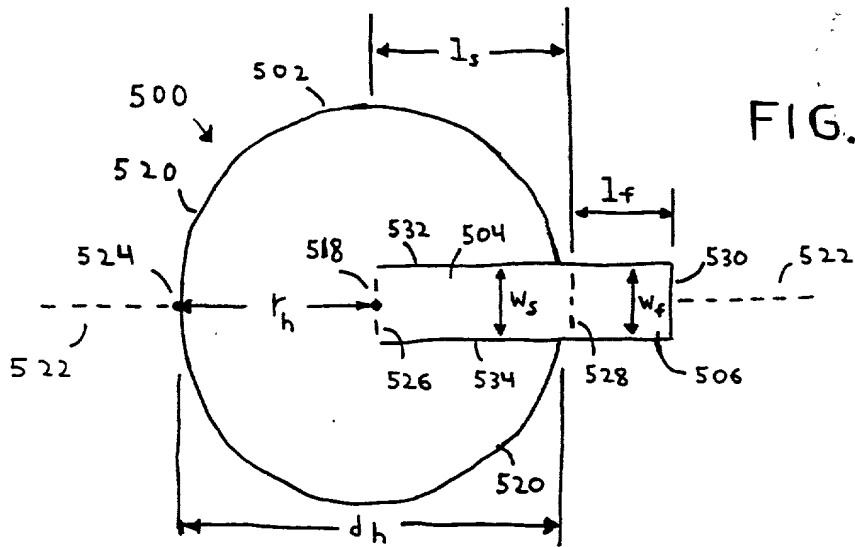


FIG. 10

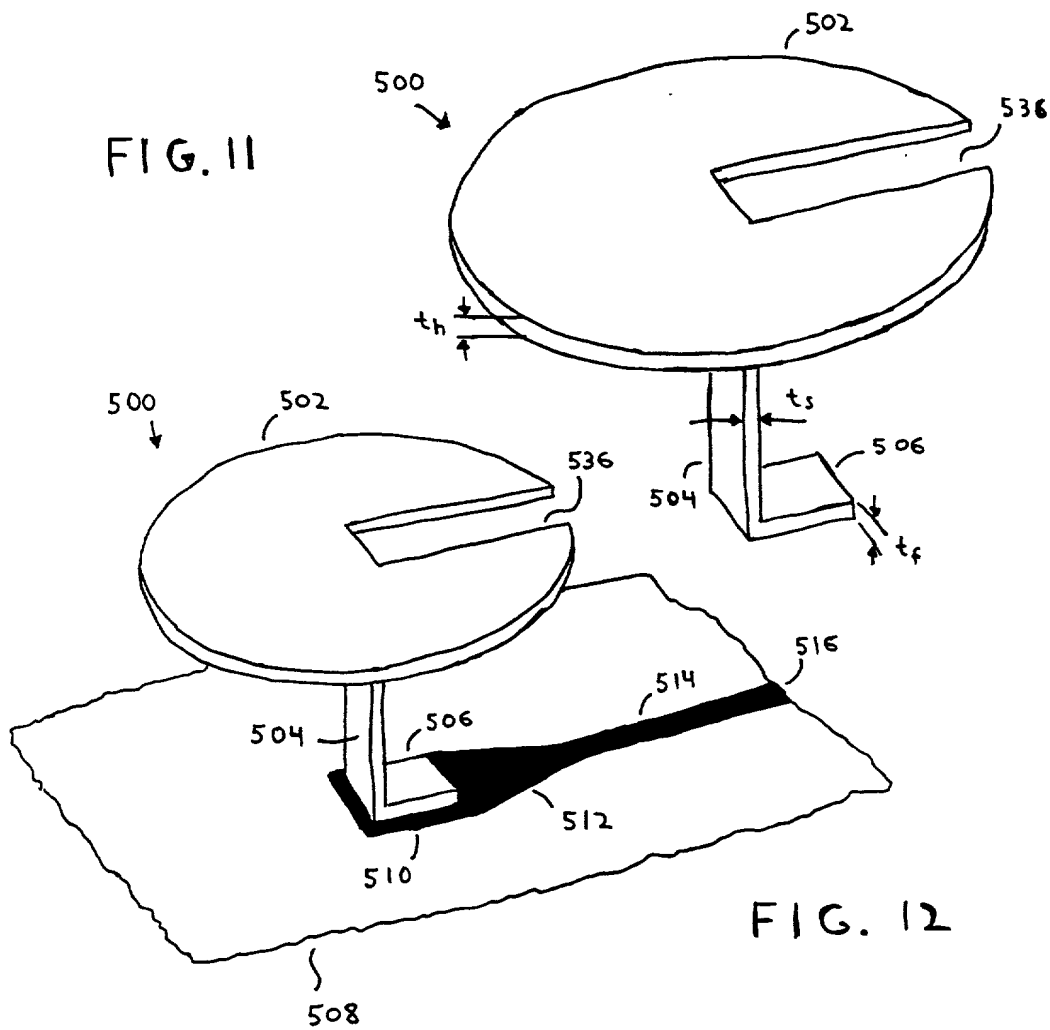
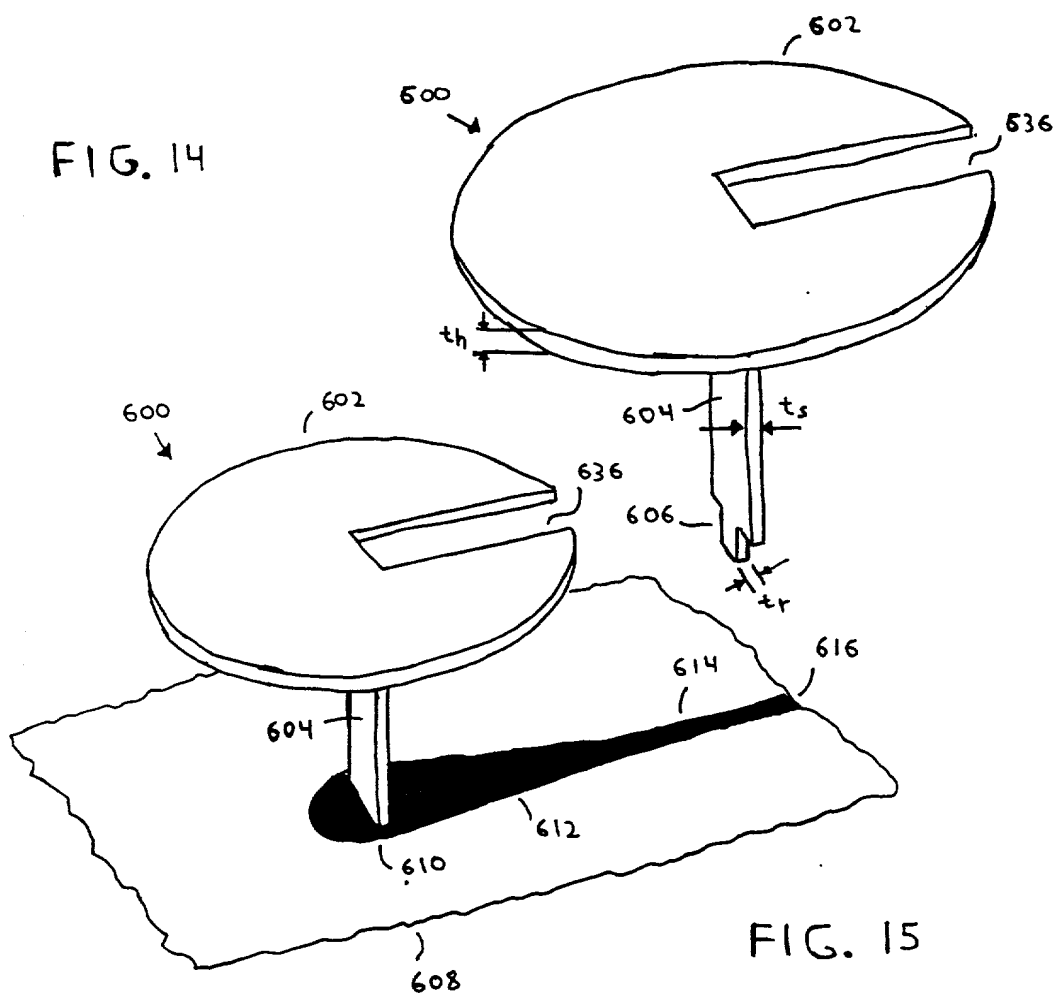
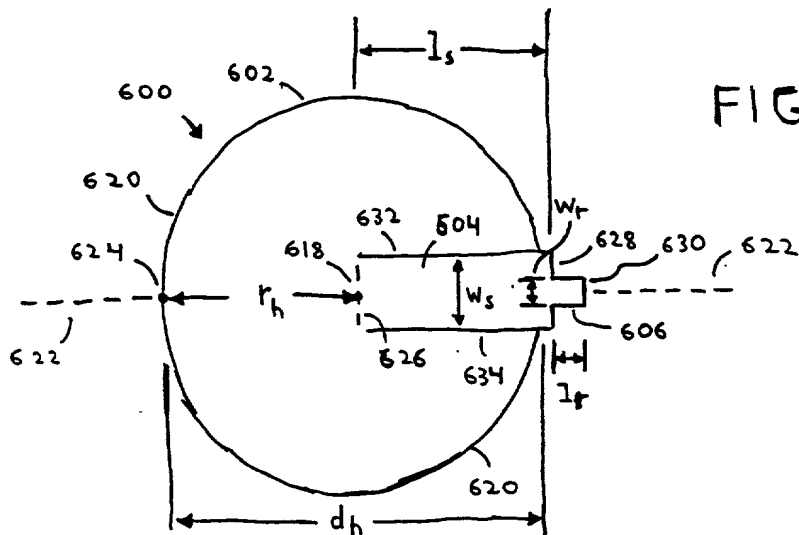
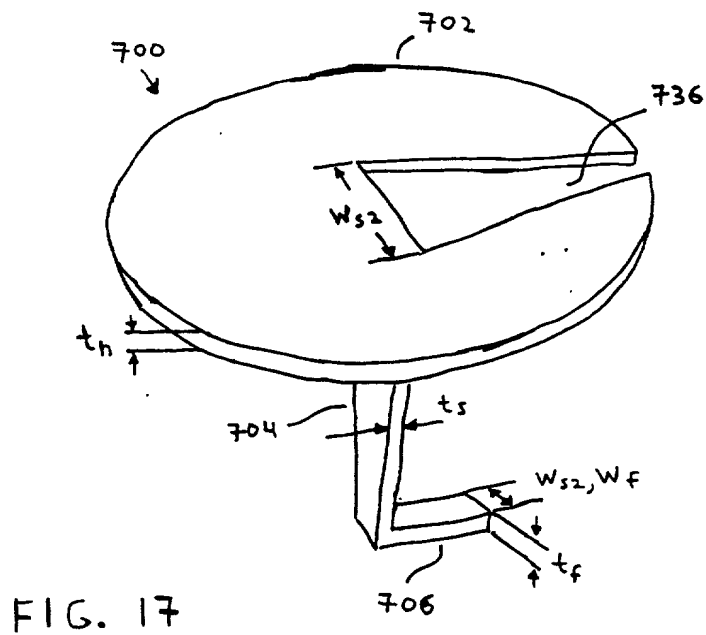
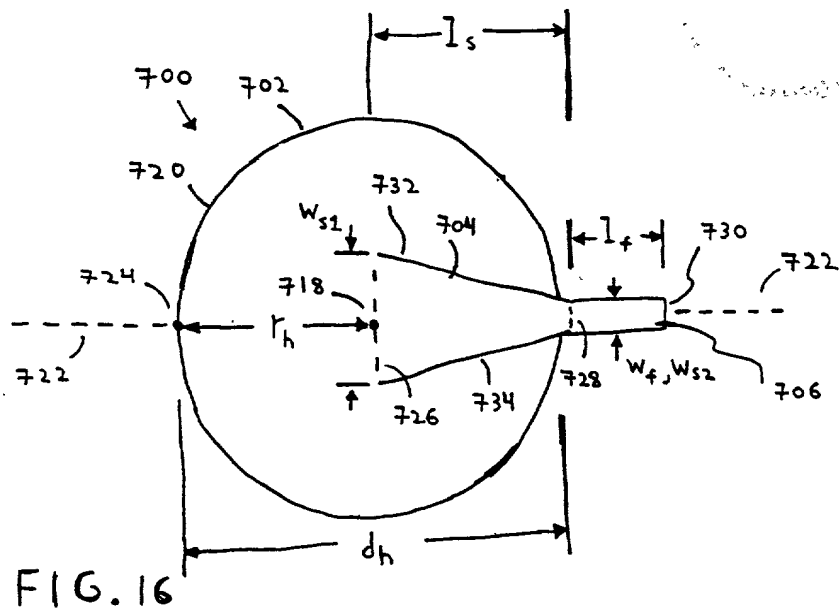


FIG. 12





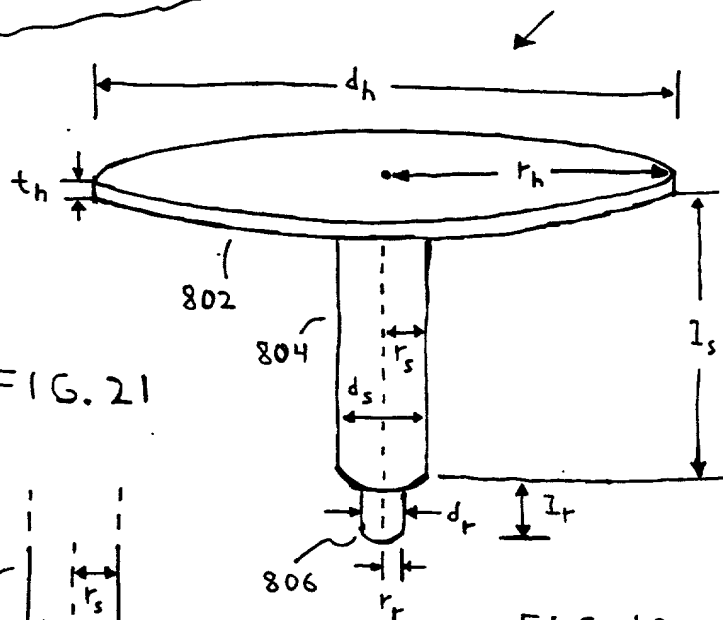
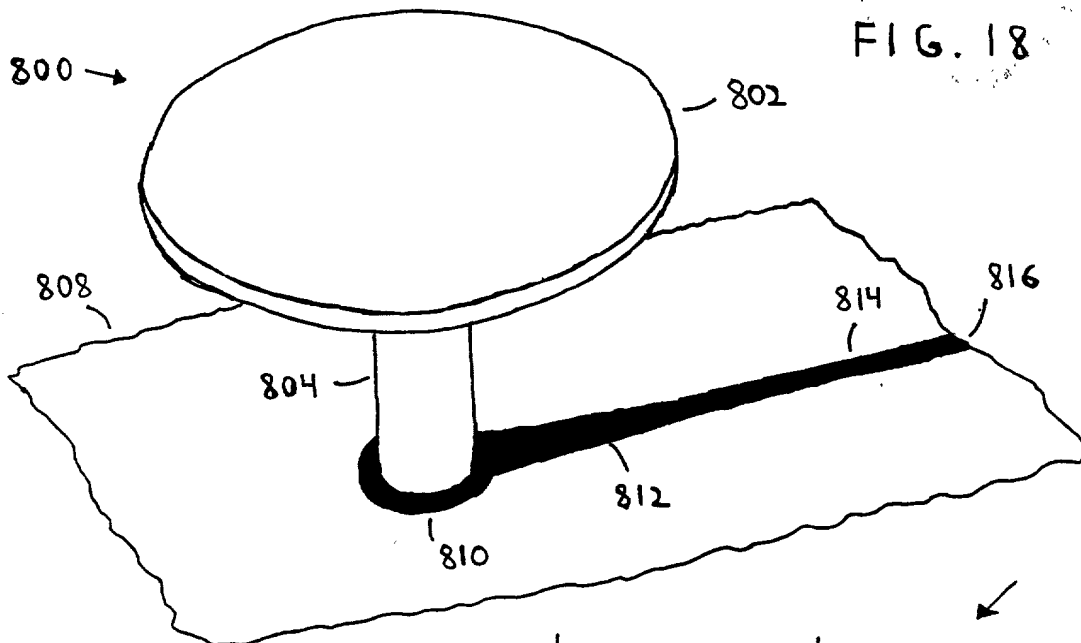


FIG. 20

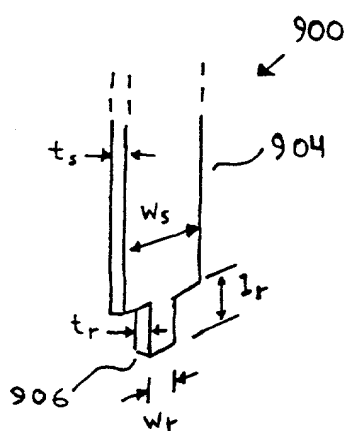


FIG. 21

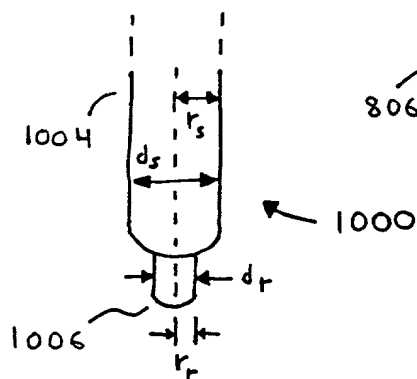
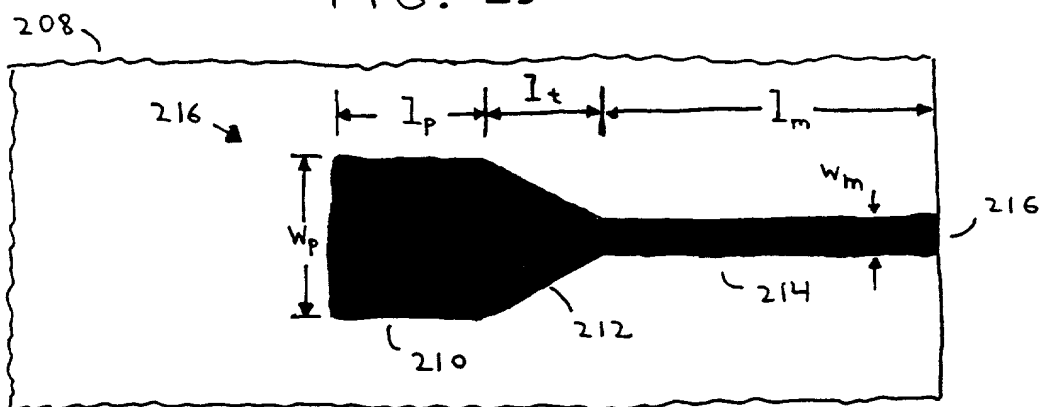
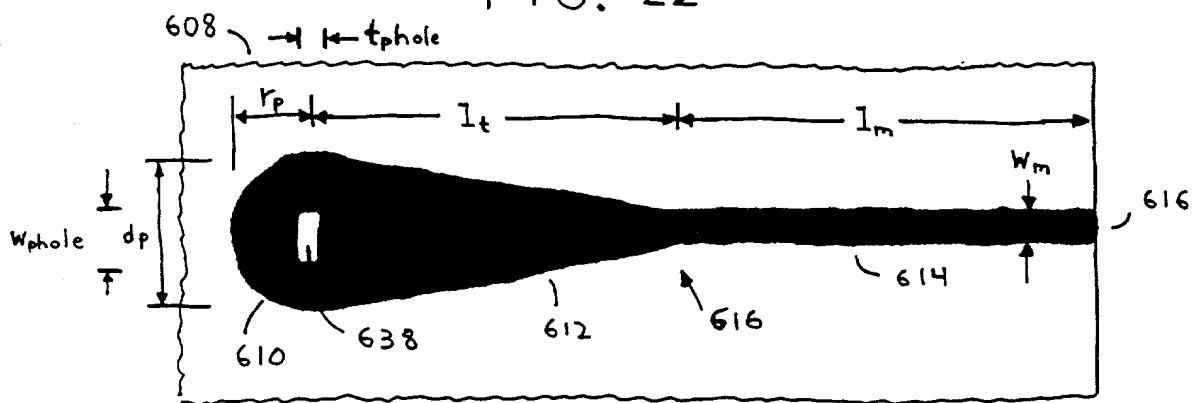
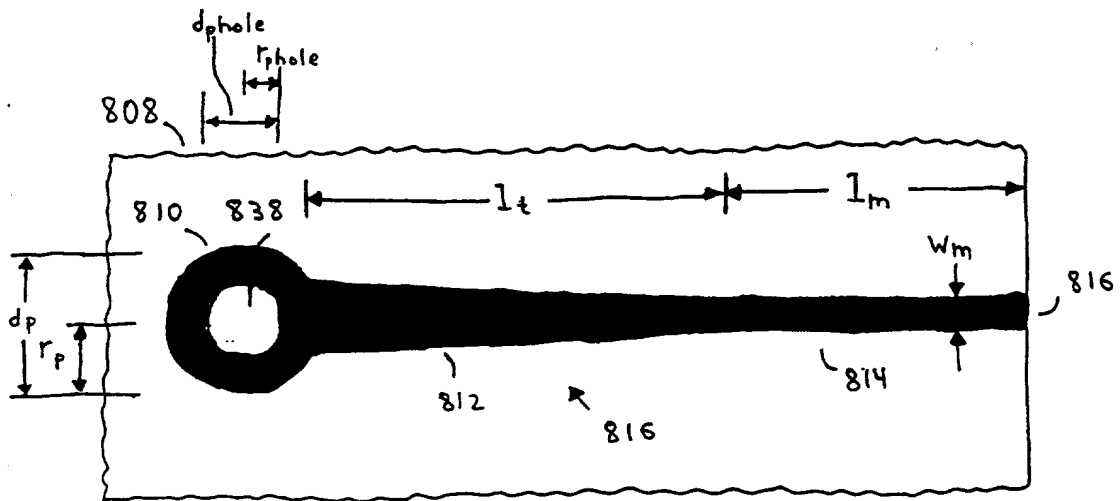


FIG. 19





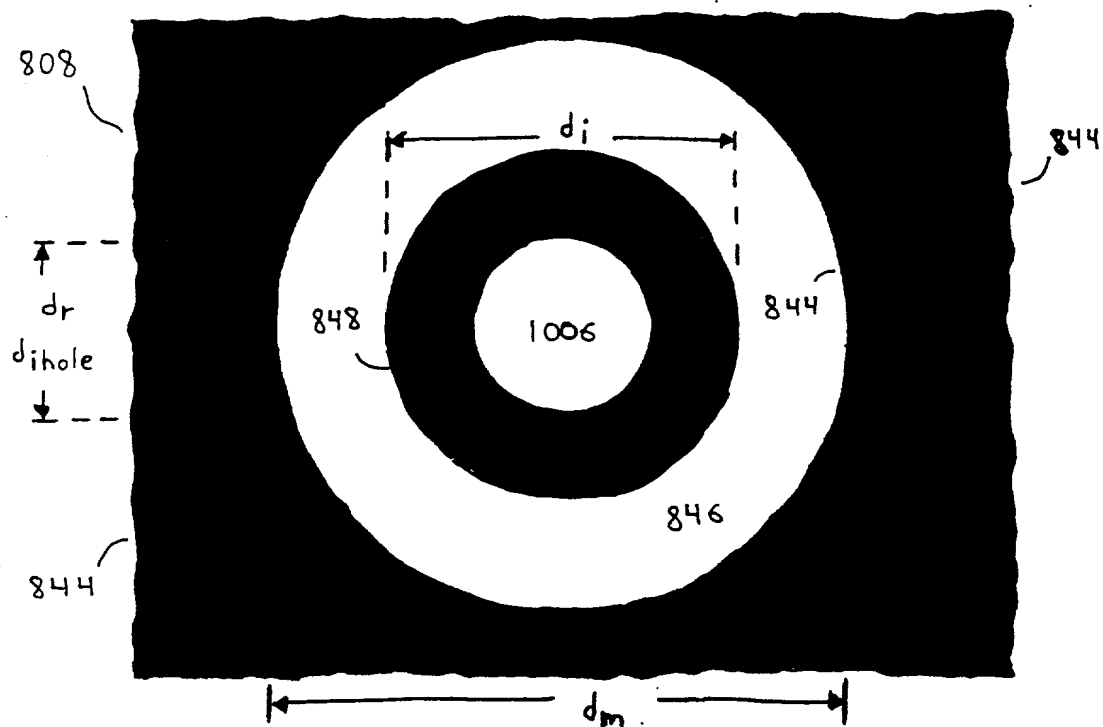
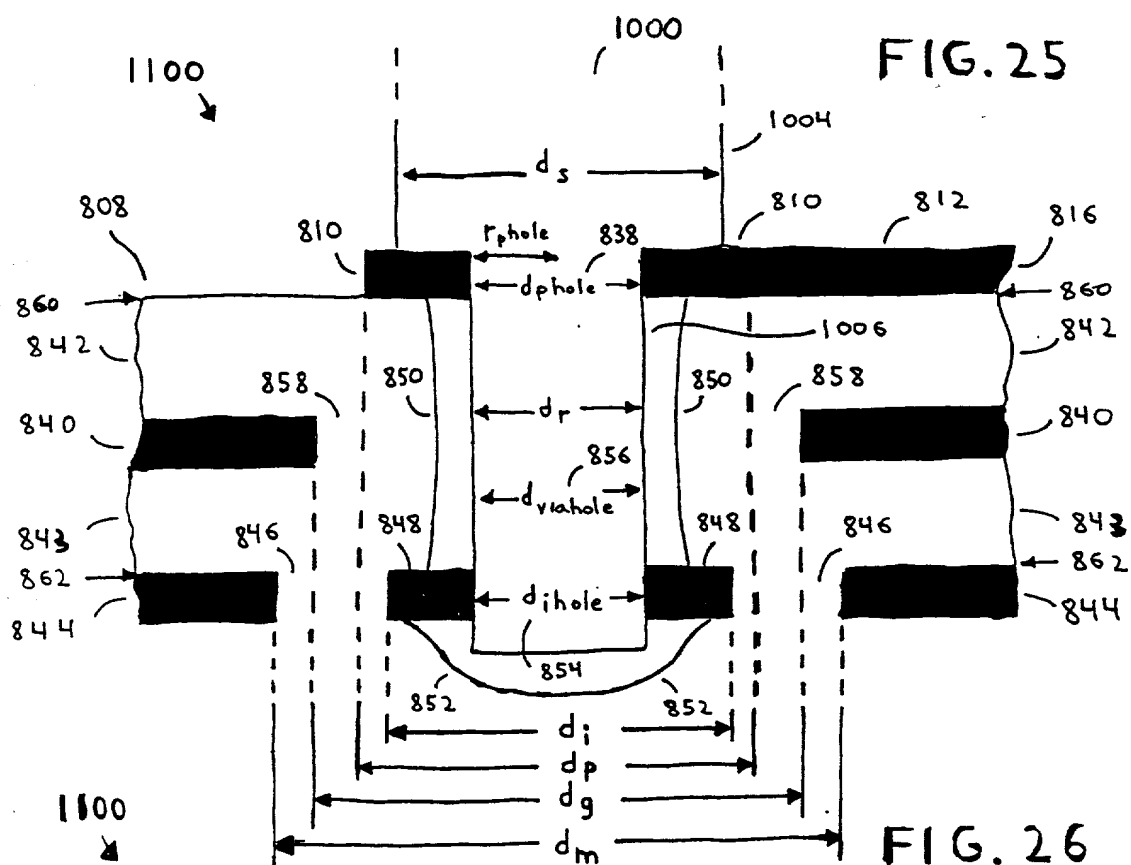
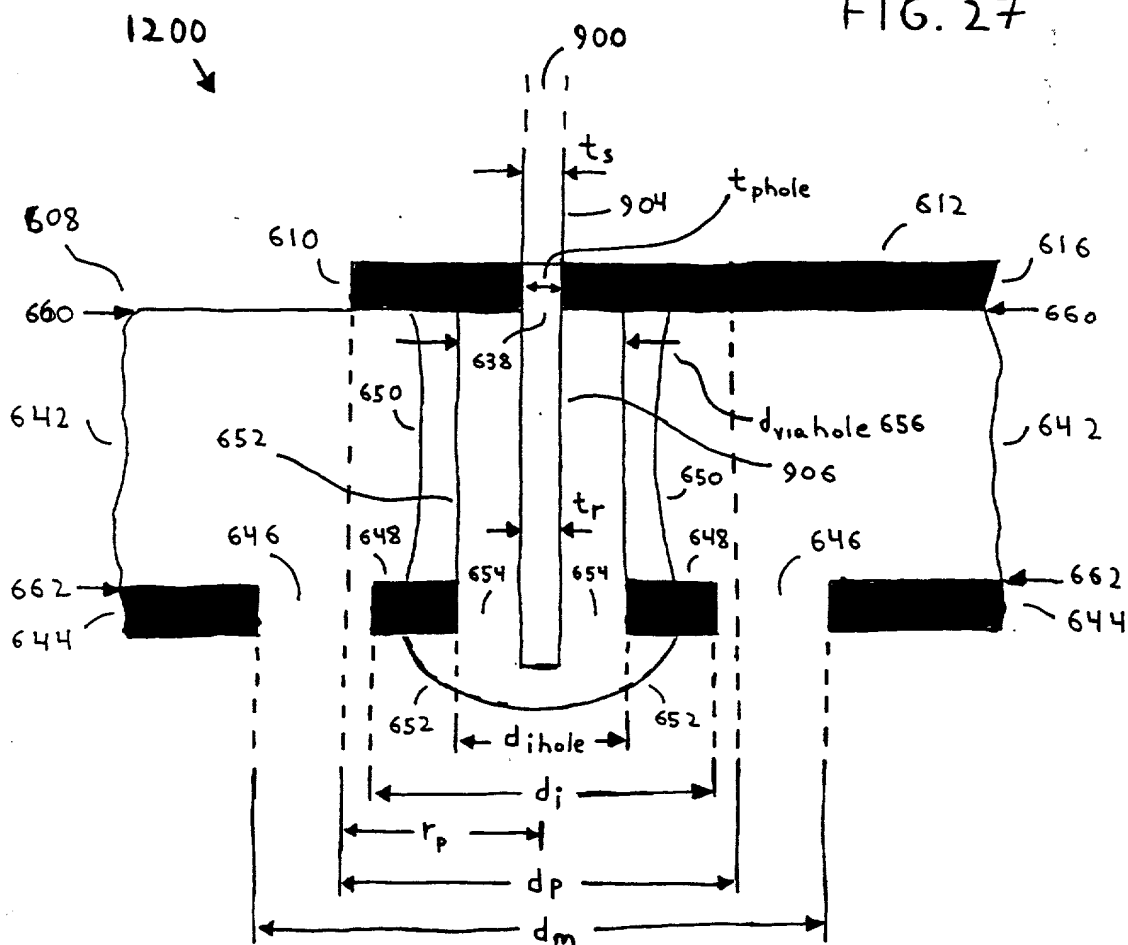


FIG. 27



100 90 80 70 60 50 40 30 20 10 0  
 4 4.5 5 5.5 6 6.5 7  
 Frequency (GHz)

# Input Impedance

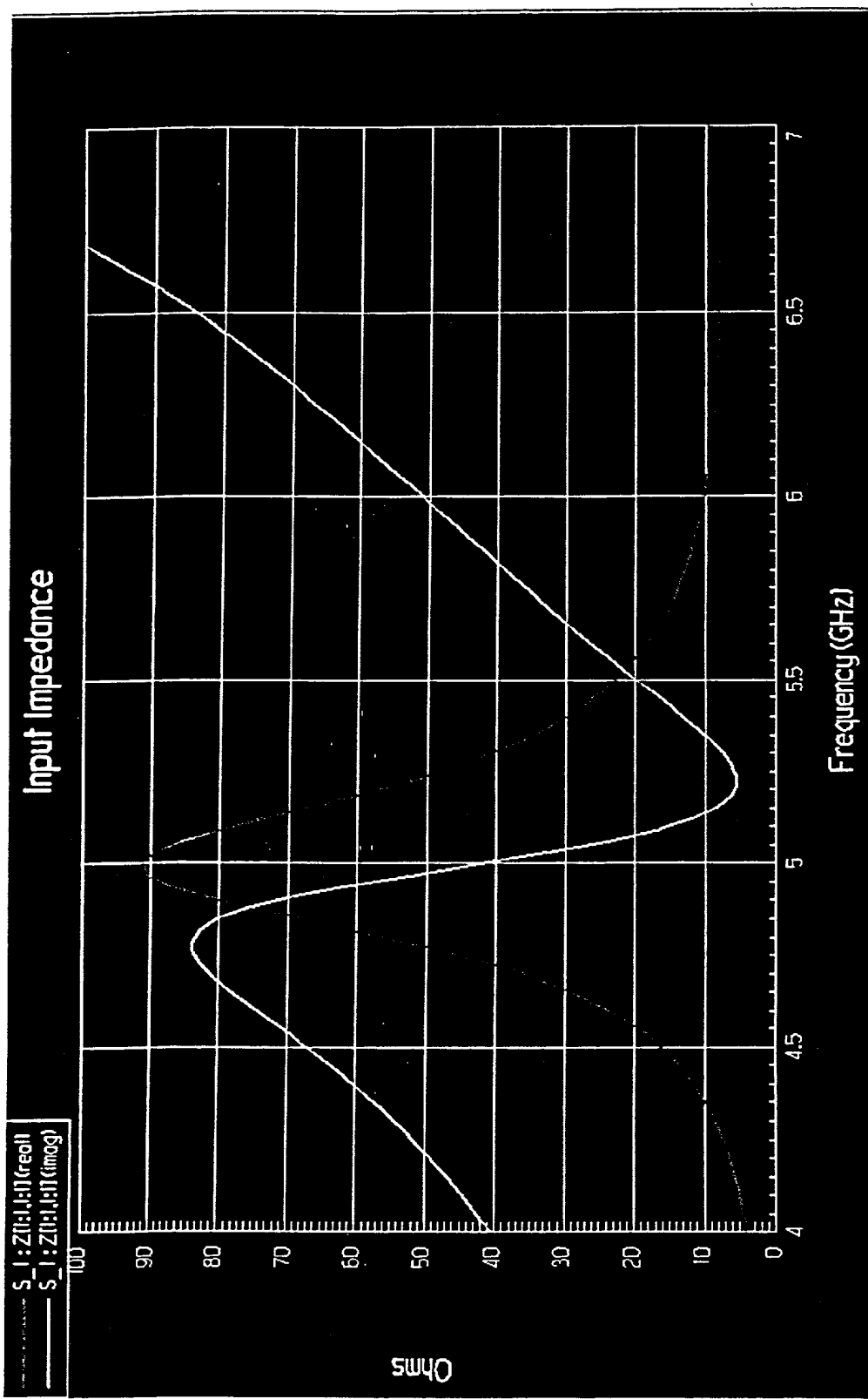


FIG. 28

Figure 29 shows the magnitude of the S<sub>11</sub> parameter (VSWR) versus frequency (GHz) for a 50 ohm VSWR. The graph shows a resonance peak at approximately 5.2 GHz, where the VSWR reaches its maximum value of about 9.5. The VSWR decreases as the frequency moves away from the resonance point, reaching a minimum value of about 1.5 at 4.5 GHz and 6.5 GHz.

## 50 ohm VSWR

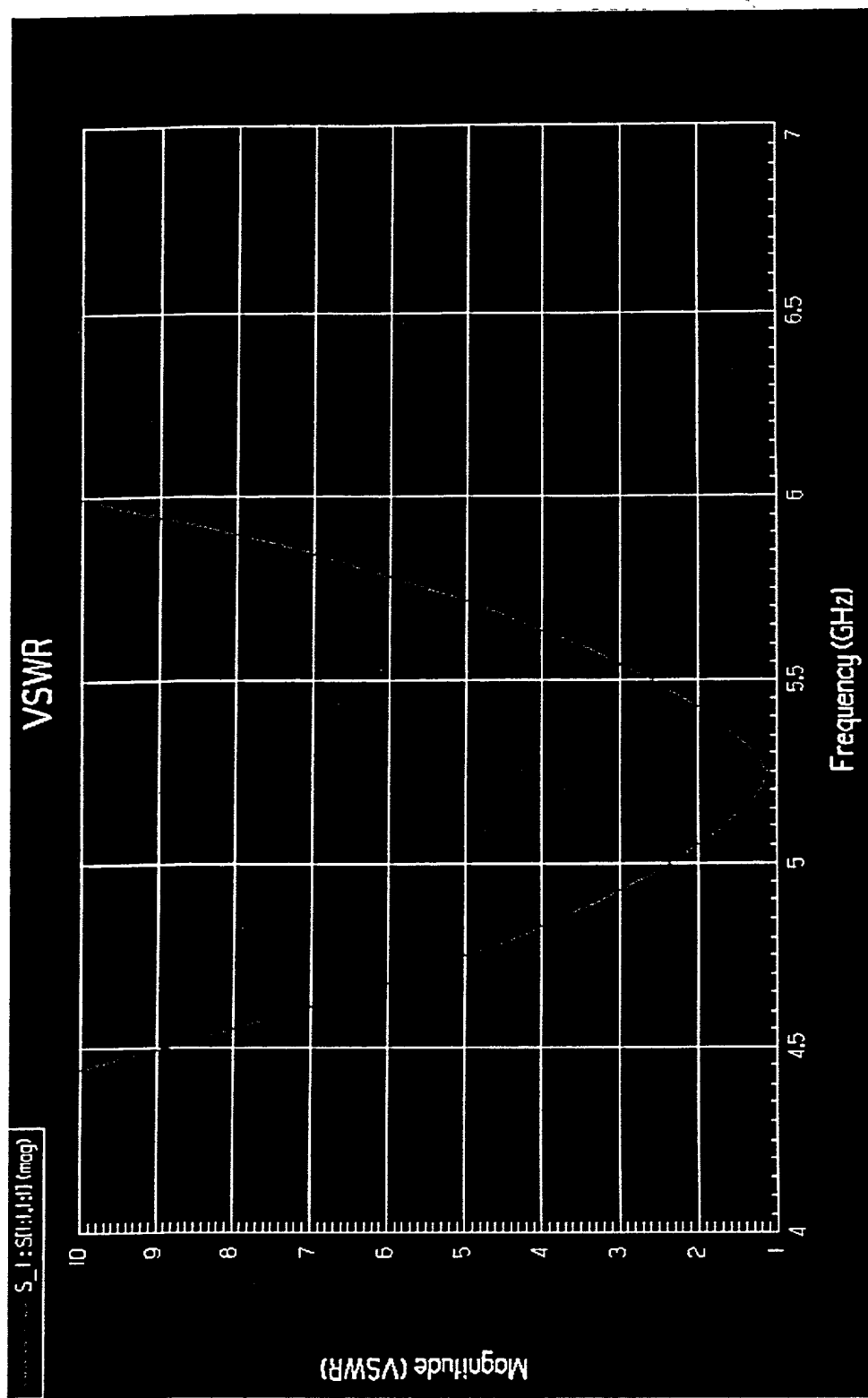


FIG. 29



[illegible]

FIG. 31

50 ohm VSWR

# 50 ohm VSWR

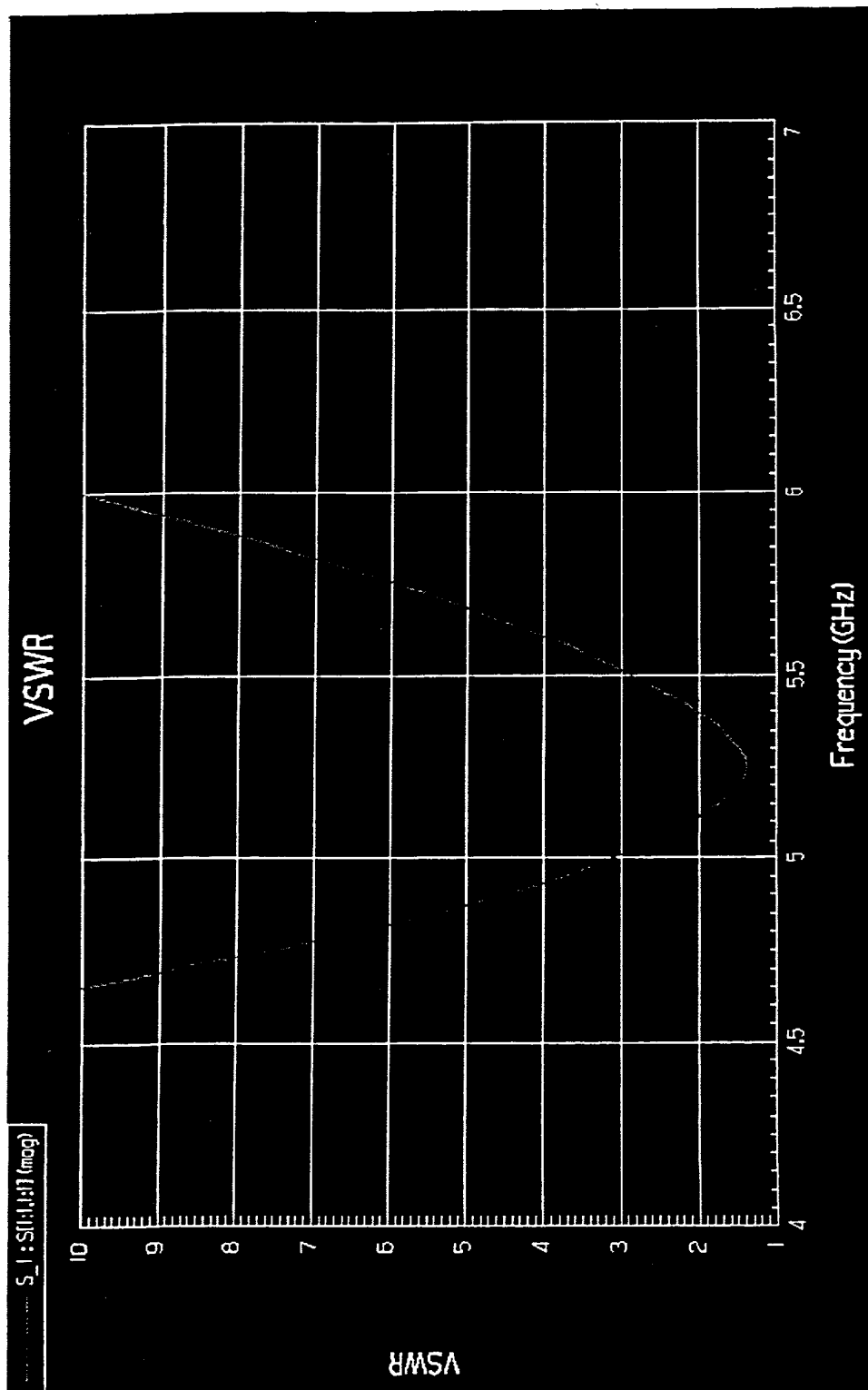


FIG. 32



50 ohm VSWR

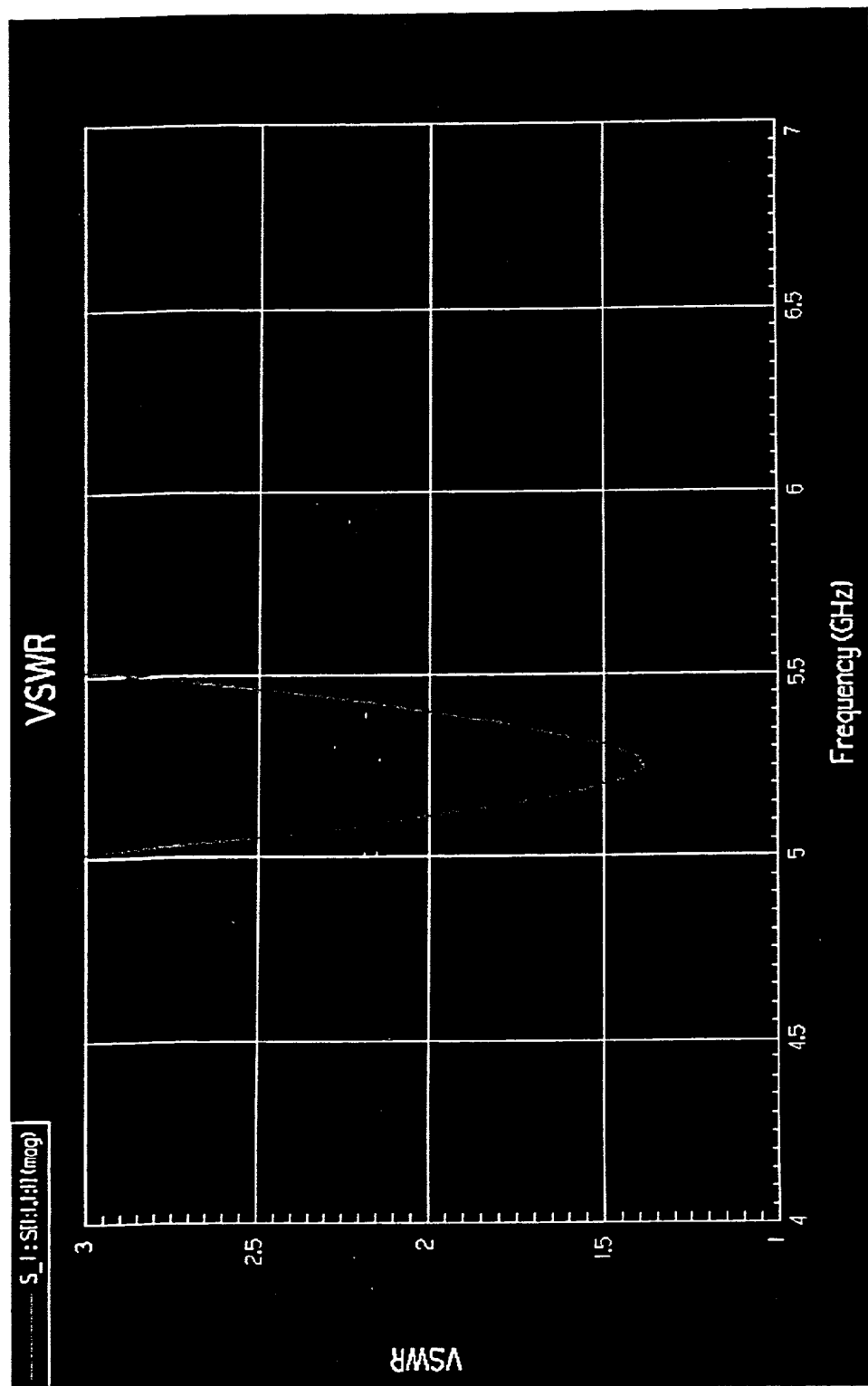


FIG. 33

# Input Impedance

Impedance for Top Hat Monopole

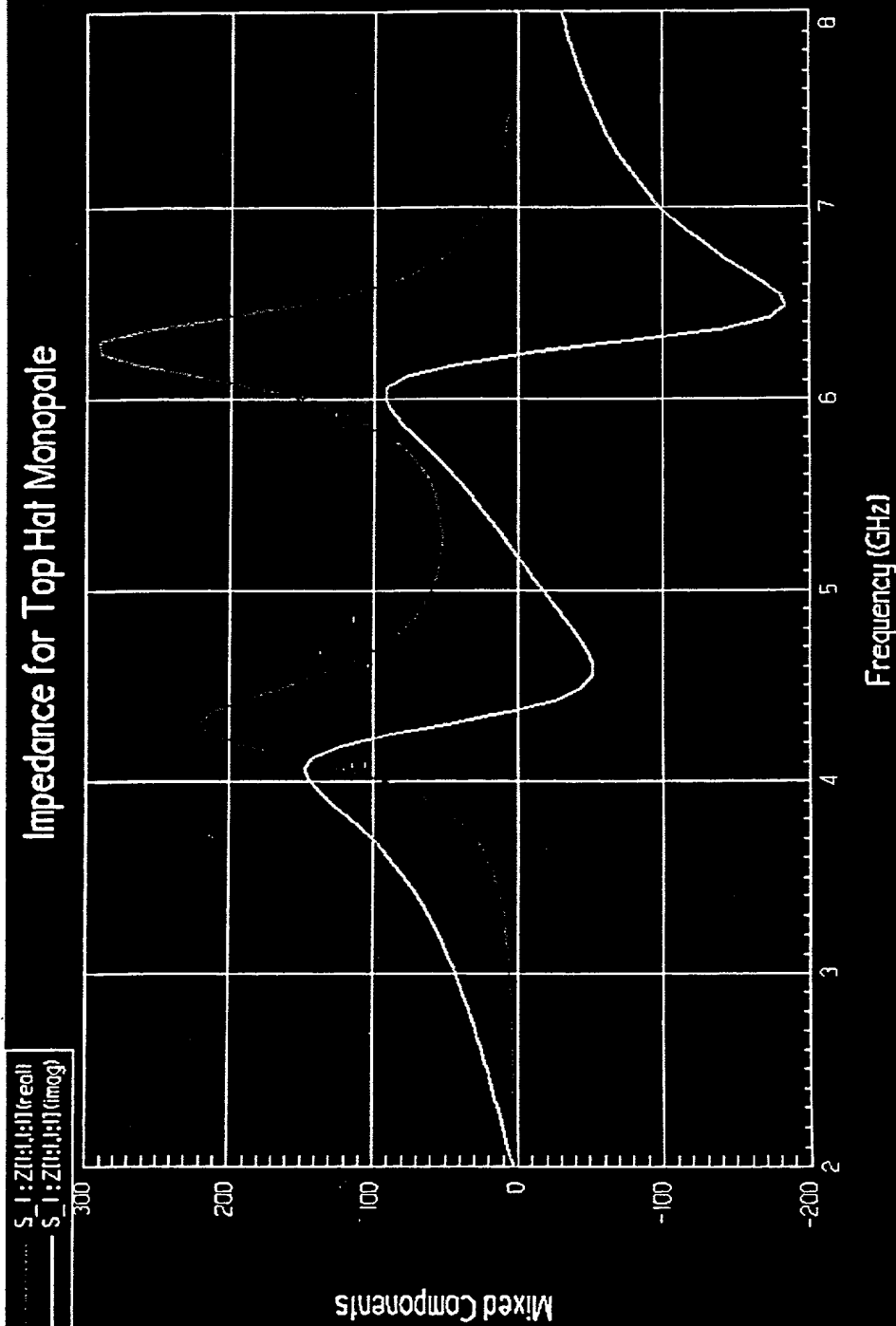


FIG. 34

# Input Impedance

Impedance for Top Hat Monopole

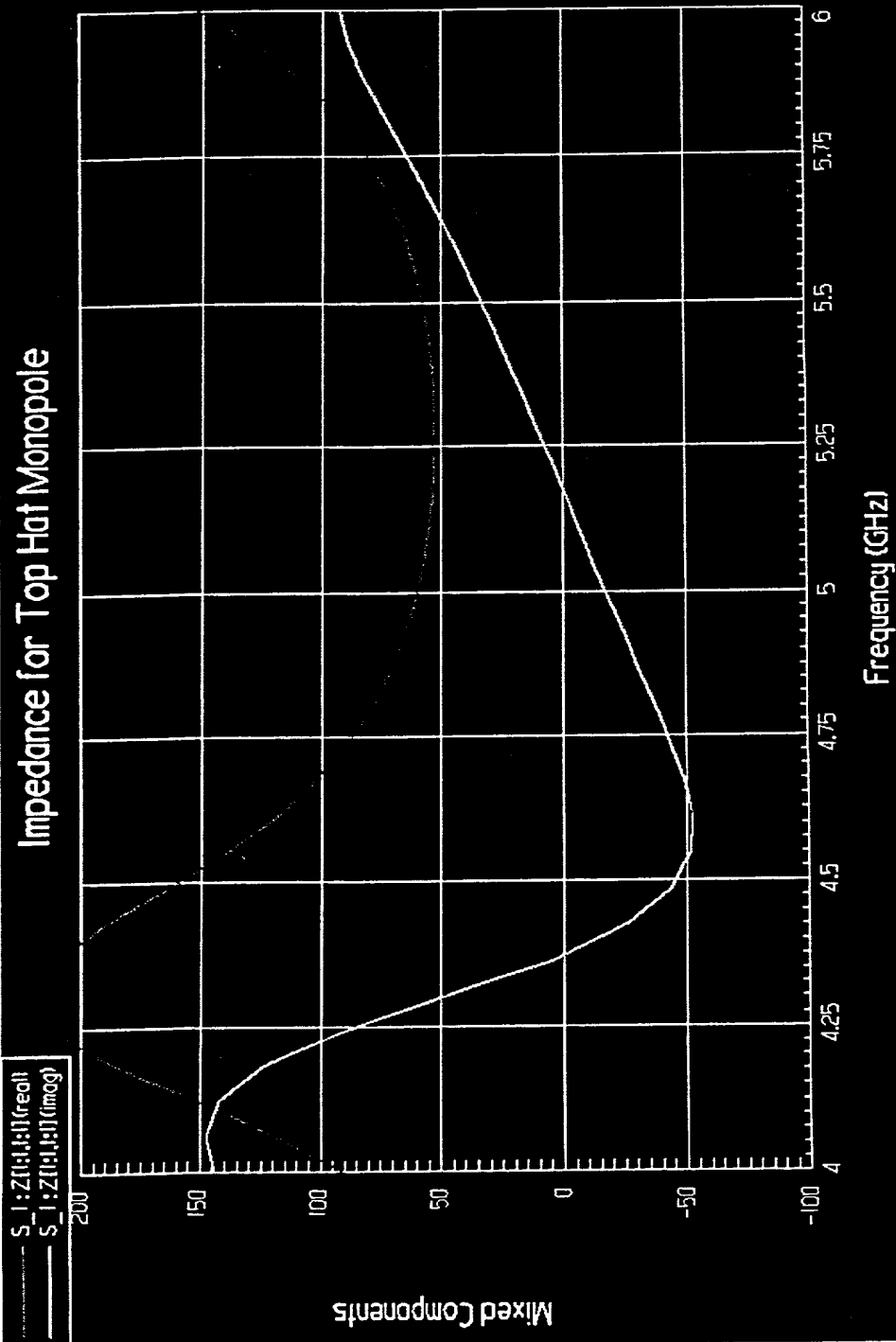
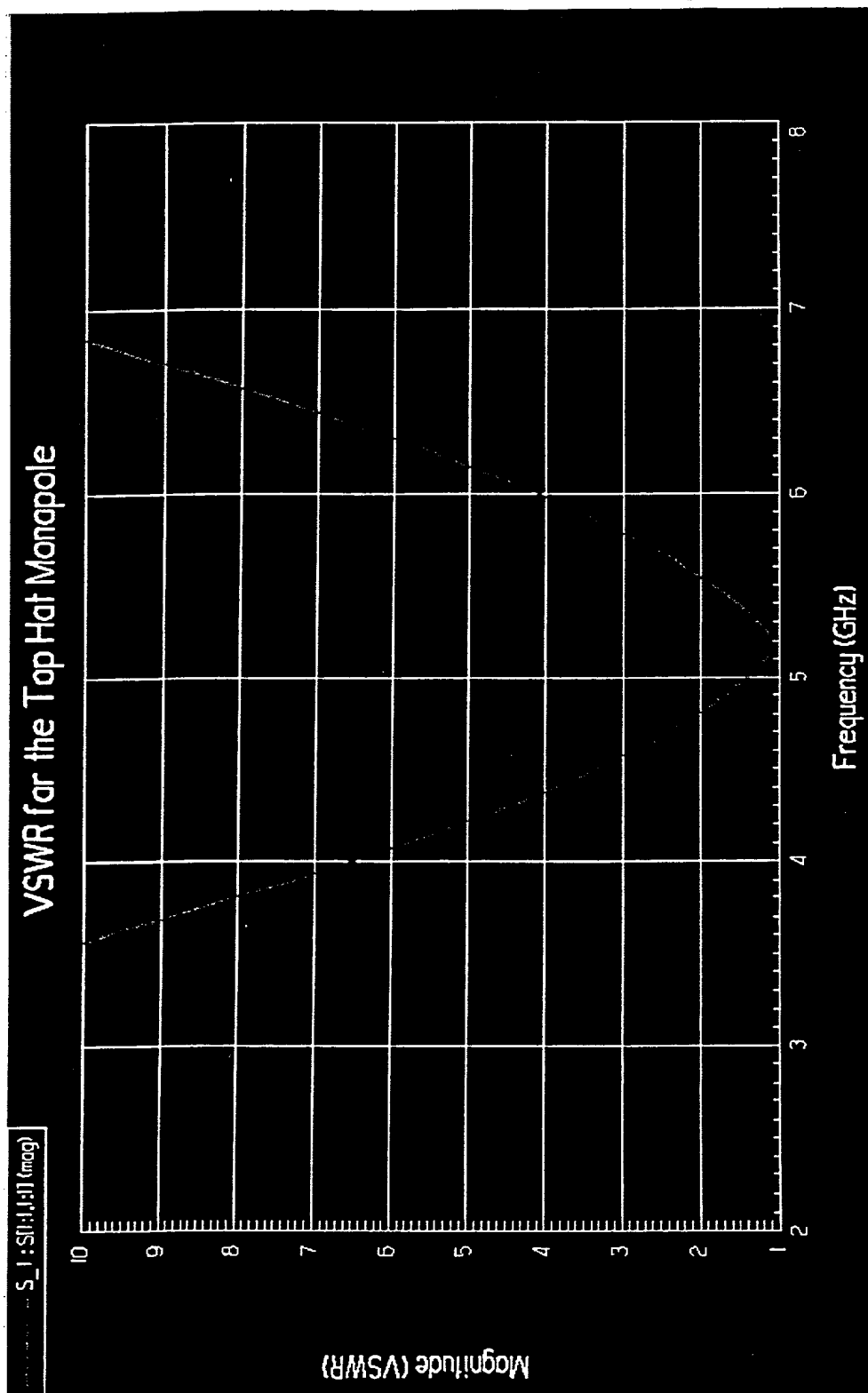


FIG. 35

[illegible]

50 ohm VSWR

# VSWR for the Top Hat Monopole



Subject: 50 ohm VSWR  
Date: 10/10/00  
By: [illegible]  
Title: 50 ohm VSWR

# 50 ohm VSWR

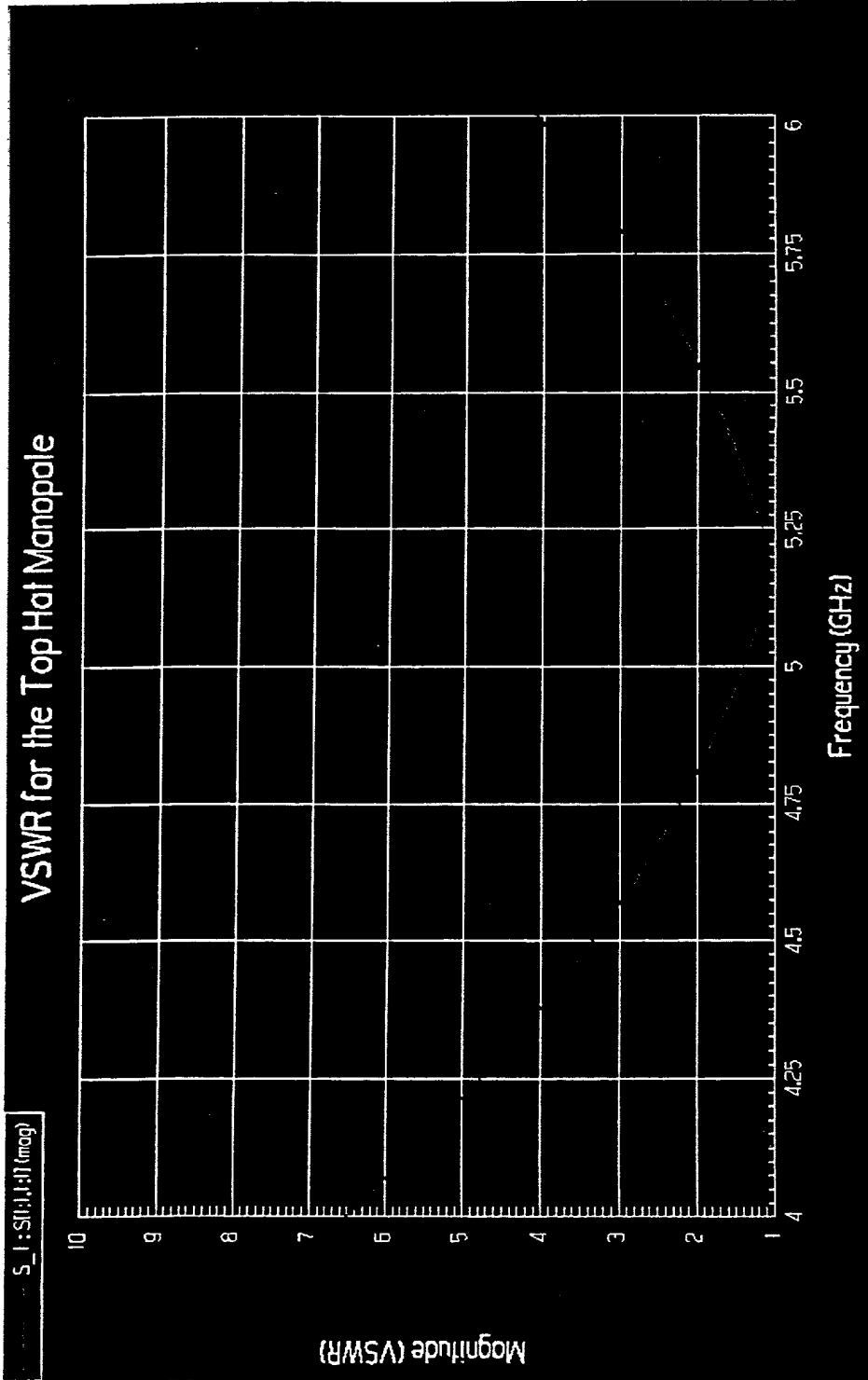


FIG. 37